titles of papers referring to mechanisms and protein synthesis in their titles[1] in the period 1950 to 1970:

Winnick, T. (1950). Studies on the mechanism of protein synthesis in embryonic and tumor tissues. I. Evidence relating to the incorporation of labeled amino acids into protein structure in homogenates. *Archives of Biochemistry*, 27, 65–74.

Novelli, G. D. and Demoss, J. A. (1957). The activation of amino acids and concepts of the mechanism of protein synthesis. *Journal of Cell Physiology,* 50 (Supplement 1), 173–97.

Yoshida, A. (1958). Studies on the mechanism of protein synthesis: bacterial alpha-amylase containing ethionine. *Biochimica et Biophysica Acta*, 29, 213–4.

Goodman, H. M. and Rich, A. (1963). Mechanism of polyribosome action during protein synthesis. *Nature,* 199, 318–22.

Griffin, B. E. and Reese, C. B. (1964). Some observations on the mechanism of the acylation process in protein synthesis. *Proceedings of the National Academy of Sciences, USA*, 51, 440–4.

Carey, N. H. (1964). The mechanism of protein synthesis in the developing chick embryo. The incorporation of free amino acids. *Biochemical Journal,* 91, 335–40.

Mano, Y. and Nagano, H. (1966). Release of maternal RNA from some particles as a mechanism of activation of protein synthesis fertilization in sea urchin eggs. *Biochemical and Biophysical Research Communications,* 25, 210–15.

Although the conception of a mechanism is widely invoked in the biological sciences, it has only recently become the target of philosophical inquiry. Chapter 2 will articulate the conceptions of mechanism and mechanistic explanation that figure in biology, especially cell biology. The quest to understand nature mechanistically has its roots in the scientific revolution and, although challenged by vitalist critics, figured prominently in the attempts to understand physiological systems throughout the eighteenth and nineteenth centuries. The key to the mechanistic approach was not the analogy of physiological systems to human made machines, but the quest to explain the functioning of whole systems in terms of the operations performed by their component parts. Beginning with Bernard, biologists also recognized the importance of the way in which the parts and their operations were organized. Increasingly, biology became a science in which phenomena were explained by discovering the organized parts and operations by which a mechanism performed its function.

[1] Another interesting class of papers uses the term mechanism not for the general phenomenon, protein synthesis, but for the way in which a particular substance alters that phenomenon. A characteristic example is the following: de Kloet, S., van Dam, G., and Koningsberger, V. V. (1962). Studies on protein synthesis by protoplasts of Saccharomyces carlsbergensis. III. Studies on the specificity and the mechanism of the action of ribonuclease on protein synthesis. *Biochimica et Biophysuca Acta*, 55, 683–9.